

United States Department
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Conservation Service
Grazing Lands Technology
Institute



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The "Grazing Lands Roundup" is a forum where we will attempt to "roundup" the latest grazing lands technology and news and present it to you, our clients and readers. Grazing, although the most predominant use, is only one use of these lands and we wish to use these pages to "roundup" any and all kinds of information pertaining to all the possible uses. We plan to include articles on improved grazing management, wildlife management, agroforestry, enterprise diversification, recreation, air quality, water quantity and quality, pasture management, hayland management, range management, landscape and watershed management, and grazing lands economics.

You can expect to read about the latest developments in computer software designed to aid in grazing lands management decisionmaking. You will be able to read about the latest projects and activities of the Grazing Lands Technology Institute.

We encourage you to send us information from your part of the world that you believe should be shared with others interested in good grazing lands resources management. Please send your articles or news to: Larry D. Butler, Roundup Editor, GLTI, P.O. Box 6567, Fort Worth, TX 76115-6567.

NRCS Creates Grazing Lands Technology Institute

Mission

One of the results of the reorganization of the Natural Resources Conservation Service (NRCS) is the creation of the Grazing Lands Technology Institute (GLTI). It is one of six Institutes created to provide leadership in a special emphasis area of technology. The mission of the GLTI is to provide knowledge and technology that is science-based, ecologically and economically sound and will meet the needs of the grazing lands' resources, landowners and managers, and the public.

Functions

Major functions of the GLTI are to develop and enhance "state-of-the-art" technologies on grazing lands. Associated functions are to coordinate grazing lands' technology development and transfer of knowledge within the NRCS and with other agencies groups and organizations. The GLTI also provides national leadership in the development, use and understanding of grazing lands' software programs, such as Grazing Lands Applications (GLA) and Grazing Lands Data System (GLDS).

Institute Members

The GLTI members have specific areas of expertise and responsibilities in which they function within the institute.

Rhett Johnson is the institute director and is also responsible for conservation planning and applications of technology on grazing lands.

Arnold Norman, grazing land decision support specialist, serves as national technical leader for the grazing land information system and provides guidance in applied landscape ecology, habitat manipulation and animal nutrition and health.

Dr. Larry Butler, grazing land enterprise diversification specialist, serves as national leader in development of grazing land enterprise information, including the ecological, economic, and social aspects of various grazing lands' enterprises such as wildlife and recreation, in addition to livestock enterprises.

Jim Cropper, forage management specialist, serves as the national leader for ecologically-based planning and assistance on grassland farming, nutrient management, dairy resource management, forage crop production and utilization and wildlife uses. **Cropper** is located at Penn State University; to contact him, call **(814) 863-0942**.

Pat Shaver, rangeland management specialist, serves as national leader on rangeland health indicators, grazing management, interagency land management issues, national resource inventory liaison and riparian area management specialist. **Shaver** is located at Oregon State University and can be reached at **(541) 737-7355**.

Johnson, Norman, and Butler are located at the GLTI headquarters office; their mailing address is: **Grazing Lands Technology Institute, Natural Resources Conservation Service, P.O. Box 6567, Fort Worth, Texas 76115**. The telephone number for the GLTI is **(817) 334-5232**. Their extension numbers are: **Johnson (3606); Norman (3623); and Butler (3622)**.

FROM THE DIRECTOR: A Message to NRCS Field Employees

Welcome to the first publication of the GRAZING LANDS ROUNDUP. We look forward to using this media to keep you abreast of the latest technology development and the activities of the Grazing Lands Technology Institute.

The major function of the Grazing Lands Technology Institute is

technology development and transfer.

As my staff and I have met with the Regional Grazing Lands Strategic Planning Committees, we have made a point of explaining that technology is developed and transferred at all levels of our agency--the field office, area, and state offices. In the field office, you are developing technology applicable to your area. The same for the area and state specialists. You know the technology needs of your work area and should be working toward solving those problems and devising methods of delivery. There are technology needs that maybe you cannot solve alone. It may be that we need research to solve a technology need. It may be that we need to develop methods of technology delivery that are beyond your current capability. There may be a technology that needs multi-agency or national coordination. These are the types of technology the GLTI can join with you in developing and transferring.

We have discussed the technology needs of the NRCS with the regional grazing lands teams. From these discussions and input from others, we are prioritizing our work to meet the grazing lands technology development needs of our agency. As you plan your work in the field, and technology needs become very evident, communicate those needs to us and we will strive to meet your needs in the future. Certainly, we cannot do everything, but we want to focus our attention and efforts in the directions that will best serve you in the field.

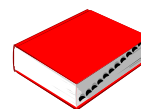
Currently, we are heavy into the preparation of the new National Range and Pasture Handbook. We have had a review of the first draft and are now making the revisions to the handbook based

on the comments we received. We will be sending the second handbook draft to the state specialists in mid-September for a review. We appreciate the time and effort of all those who provided review and comments to the first draft. This has given us insight on how we can improve our handbook for field use.

This newsletter will provide you an update on many of the projects on which we are working. Soon, you will have GLTI products in hand that will help you as you lead landowners to understand their grazing lands, manage them to conserve the natural resources, and meet their objectives.

Rhett H. Johnson

National Range and Pasture Handbook



One of the first products to watch for is the National Range and Pasture

Handbook. This will replace the 1976 National Range Handbook and will encompass all types of grazing lands--rangeland, grazed forestland, pastureland, hayland and grazed and hayed cropland. It will be updated to support the technology embedded in the Grazing Lands Application Software. Also included will be technological advances in plant physiology, ecology, range and pasture health, livestock nutrition and animal behavior, hydrology of grazing lands, diversified uses of grazing lands, and grazing lands automation software. The GLTI will route the draft version of the new handbook to its partners, both inside and outside the NRCS. The GLTI welcomes comments and input on any and all aspects of the handbook.

Pasture News

by Jim Cropper

These are exciting times for grazing lands in the pasture regions of the United States, and really the World.

Recently, there have been a number of grazing conferences held around pasture country, such as the Wisconsin, Great Lakes (Michigan, Ohio, and Purdue Extensions), Pennsylvania, and New York conferences.

Attendance was high and so was the intensity level among the participants. When I say participants, I mean the farmers themselves. Often times they are some of the featured speakers rather than just being passive participants. Pasture schools are also prominent. Three that I have recently seen are being produced by the Universities of Arkansas and Missouri, and Pennsylvania State.

The latest issue of the newsletter, "Pasture Profit" is being distributed to all NRCS employees in the pasture regions of the U.S. (east of the Missouri River) with a limited number going to rest of the country. This is a newsletter originally put together cooperatively with the Northeast Pasture Management Coordinating Committee. Circulation has grown to include many farmers in the northeastern states, extension employees, as well as subscribers in Canada and Argentina.

I have completed a draft on soil suitability groups for forage production. This explains a new selection process used to group soil mapping units based on their similarities in forage production and management needs. It also gives the new procedure on how to describe these suitability groups,

give yield estimates for forages commonly grown on the soils in the group, and provide management advice on treating these soils to enhance or sustain their productivity.

Grazing Lands Publications

Soon you will be seeing three new publications for field office use. They should be arriving at your desk within the next couple of months. The publications are:

Grazing Lands Economics - Made Simple: Understanding Internal Rate of Return and Net Present Value. This is a booklet written by Larry Butler. Larry says it has several things going against it from the start: it is a government publication, it is about economics, and its title sounds complicated. Don't let these things fool you, we think you will enjoy the format and content of this booklet. If you give it a little attention, you will understand IRR and NPV once you have read it.

Grazing Lands Enterprise Diversification. This is a three-fold brochure developed by Larry Butler that will introduce you to enterprise diversification. It will tell you why landowners are diversifying and what the GLTI is doing to help.

Conservation Planning on Grazing Lands: The Art of Communication. This is developed from notes written by H. B. Passey in 1969. It is full of insight on how to communicate with landowners while providing conservation planning assistance. Rhett Johnson has adapted Mr. Passey's notes to bring them up to date with what NRCS does today while providing conservation assistance

on grazing lands. The information can help us all do a better job.

A reprint of the 16-page *Dairy Farmer Profitability with Intensive Rotational Grazing* brochure by Jim Cropper will also be distributed soon. It addresses the economic benefits of intensive rotational grazing in comparison to continuum pasture, hay, and corn silage. This information is based on a study of 52 cooperating farmers selected from nearly 350 farmers practicing intensive rotational grazing in Northeast Pennsylvania.

Diversification of Enterprises on Grazing Lands

Cash income from grazing lands has traditionally been from the sale of livestock and livestock products. The owners of grazing lands are breaking with traditions and are considering the various opportunities for increasing profits and diversifying their enterprises on their grazing lands with alternative and supplemental enterprises and nontraditional uses.

The Natural Resources Conservation Service (NRCS) Grazing Lands Technology Institute (GLTI) is responsible for acquiring, developing, adapting, and transferring enterprise technology to the NRCS for field office use with landowners and managers. Dr. Larry D. Butler is the GLTI enterprise diversification specialist who devotes full-time to this responsibility.

The number and kind of enterprises for any land unit depends upon the resources available. Each land unit must be assessed to recognize its potential

and enterprises must be tailored to the individual grazing land operation. The selection of an additional enterprise or significant change to an existing enterprise should be done following an inventory of existing conditions and resources and after an evaluation of the effects the enterprise will have on the resources and the total grazing land operation.

Grazing land owners have numerous reasons to diversify their enterprises, among them are:

- current enterprise making an acceptable profit
- desire to increase income
- financial risk can be reduced
- to increase or better distribute cash flow
- to utilize available resources: such as labor, facilities, & natural resources
- to change operations because of regulations
- to take advantage of consumer desire or need
- to enable next generation of family members to remain on the farm or ranch
- prefer to operate a different business

Grazing lands enterprises are developed around existing farm and ranch resources and must be managed to maintain and/or improve the resources upon which they depend. A few enterprise examples are: working ranch vacations; hunting; photo safaris; bird watching; bed & breakfast inns; fishing; camping; historic tours; grazing/agroforestry enterprise combinations; nontraditional livestock production systems; direct marketing of traditional livestock products; and, of course, traditional livestock enterprises. The possibilities are almost endless; watch for information on specific enterprises in future newsletters and GLTI publications.

Enterprise Diversification Newsletter

The Grazing Lands Technology Institute will be issuing a newsletter about grazing land enterprises. If you would like to receive the newsletter or if you have information about a unique grazing land enterprise or other information that you would like to share, please contact:

Dr. Larry D. Butler
Enterprise Diversification Spec.
USDA - NRCS - GLTI
P. O. Box 6567
Fort Worth, Texas 76115

e-mail address:
lbutler@ftw.nrcs.usda.gov

A Glimpse of Grazing Land Values

by Larry Butler



The afternoon rain shower has just ceased, relieving the hillside of the spring day's heat.

Butterflies flutter about in the clearing sky and birds sing their songs of nature. A portion of last year's grass growth, left standing in the meadow, provides a source of nesting material for the song birds. The soil is protected by the shields of leaves casting their shadows across the soil surface. These leaves of grass provide nature with its own filtering system and add to the richness of the soil when their life cycles end.

A deer browses along the meadow's edge taking in the nutritious tender shoots as she

nears her fawning time. The meadow's grass will provide the fawn with its security blanket in the months to come as the doe leaves her fawn to feed and drink from the stream.

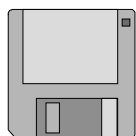
The water is released slowly across the landscape, thanks to proper management efforts of conscientious landowners with genuine concerns for the future as they hope to leave their heritage with the ones that follow in their footsteps. The water still flows in the streambed, having just left the grass leaves on which it had fallen, continuing its journey in its never-ending cycle. The water is clear as the properly grazed land holds tightly to its soil.

The water will continue its flow downstream where it will be available for all its many uses. Industry and agriculture can flourish, cities can thrive, and people can prosper. The local community, the state, the nation, and the world itself will be the beneficiaries of the good management applied to the grazing land upon which this water first fell.

A fisher will, unknowingly, reap the first benefits of this proper management as the sought-after, prize fish lives and reproduces in this life-giving water. The fisher's young boy and girl float "mystery ships" made of tree bark across the "raging" current of "white water" barely knee deep to the young girl. They will remember this first encounter with nature and its beautiful sights, sounds, and smells. They will remember their parent's time spent showing them how they sailed ships in the streams of their childhood days. Their family will be stronger and their country will reap the benefits of their citizenship when they are grown and, along with the landowners' children, are in charge of the nation's affairs.

It is humbling to think of the far-reaching effects a spring rain, a properly managed grass-covered hillside, and a clear stream could have on the future of a nation.

GLA News



Grazing lands specialists are beginning to have organizational meetings throughout

the NRCS regions to coordinate the development of plans to implement the FOCS Grazing Land Applications. Coordination is necessary to develop data bases.

Each region is also formulating their training teams to deliver GLA training to the state and field levels. The GLTI has been requested to assist regional training teams to organize their needs. This assistance has been provided in several regions. The GLTI will, upon request, provide mentors for training sessions conducted by the regional GLA training teams.

A revision of the user manual for GLA is underway and should be completed early next year. Additional information on the HELP screens is in progress. The corrections to complete tract planning capabilities and planning capabilities using mapping units with complex soils are scheduled for correction and release early in 1997.

Rangeland Health

A definition of rangeland health has been agreed on by the NRCS, FS, BLM, NBS, and EPA. This definition and the concepts of rangeland health were revised and refined by the above agencies by

an ad hoc interagency committee on rangeland health.

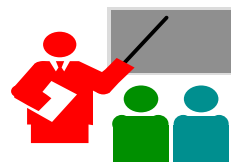
NRCS has further refined the concepts as they will be applied in the field. This information will be contained in the second draft of the new National Range and Pasture Handbook. This refinement has been accomplished with the input of other agency personnel and with the input of at least three of the authors of the National Research Council's "Rangeland Health" publication.

Rangeland health determinations assess the functioning of the ecological processes on a rangeland ecological site. The assessment evaluates indicators of the functioning of the water cycle and hydrology, mineral cycle, energy flow, and the sites ability to resist disturbance and to respond after disturbance.

The methodology for this assessment has been developed for a national inventory, and tested in the field in at least six states. These tests have included several different types of rangeland and employees from the NRCS, ARS, BLM, FS, and universities. It is being tested further in the 1996 NRI Soil Quality test being conducted this summer. After the analysis of the results, Rangeland Health assessment will be ready for the 1997 NRI, or any national inventory type assessment. There is a great deal of interest by the range professionals in the BLM and FS to use this in a national inventory on lands that they administer.

NRCS state and field employees that have been involved in the testing of the concepts and methodologies are generally pleased with the concepts and see rangeland health as a useful tool in training and working with rangeland managers.

Training Courses



The GLTI is working very closely with the National Employee Development Center in the development and conduction of eight grazing lands courses with seven different universities across the nation. These courses are designed to provide NRCS the latest in technology. States are using these courses to train their specialists and field office personnel in order that they can return home and provide leadership in the training of more NRCS employees as well as provide the new knowledge to landowners. The following is a brief summary of the courses.

Plant Herbivore Interaction, Utah State University

Dr. Fred Provenza is the leading research scientist in the study of animal behavior in relation to their grazing habits. In this course you develop an understanding of why animals do what they do, such as how and why animals choose what they eat. You actually see animals go through learning processes to determine the species they eat. It is through knowledge and understanding of animal behavior, plant protection mechanisms, and responses to grazing, that we can design grazing programs that use animals as "tools" to make happen what is desired to happen in the ecosystem. This course will give NRCS employees information and a knowledge base to use for the rest of their careers. This course has been highly successful.

Working Effectively With Livestock Producers, Texas Christian University

This course has been a winner for many years. It teaches the ranching industry "from conception to consumption." The intent of the course is to provide NRCS employees a strong educational background that will allow them to understand the total business that a landowner needs to know to operate a livestock operation. TCU teaches a 9-month course for livestock operators who want to have a working knowledge of the industry. It covers everything you need to know from conservation of the resources to husbandry, business economics, etc. This NEDC course gives a two-week snapshot of the highlights of the 9-month course. The course has always received outstanding reviews from the participants.

Rangeland Ecology - Texas A&M University

This course is designed to update NRCS personnel in the latest science of rangeland ecology. The course provides a complete discussion on the latest technology on subjects such as plant growth, the rangeland ecosystem, shrub ecology, range hydrology, wildlife management, as well as global warming. This is a packed two-week course that includes a field trip where you hear and see much of the discussion on the ground. Even though this course centers around the range ecosystem, the ecological principles taught are very applicable to pastureland and forest ecosystems. This course has received outstanding reviews by the students.

Prescribed Burning - Texas Tech University, Oklahoma State

University and Utah State University

We have three universities providing courses on Prescribed Burning. All three are leading universities in the science and art of prescribed burning. By having the course in 3 locations, we are able to allow students to attend the training in the area more compatible to that in which they work. These courses have been very successful. The classes are a combination of classroom and field where actual controlled burns are planned and applied by the students.

Pastureland Ecology I - North Carolina State University

This is a new course that we have developed and conducted for the first time this year. It is designed to provide an in-depth understanding of the pastureland ecosystem and the management of the system to meet the needs of the plants as well as the animals. There is hands-on work with livestock and pasture where the student develops first-hand knowledge of management intensive grazing. This course was an outstanding success this first year and will prove to be even better as we work to refine it for next May.

Pastureland Ecology II - Penn State University

This course is in the development stage and will be held for the first time this coming spring. This course will address pastureland dairies and provide the student an in-depth education on the operations of a dairy and the use of pasture as the main source of nutrients for the animal. The desired outcome of the course is to prepare students to work with dairy producers to assist them in

improving or converting to pastureland as a means of managing their dairy in an ecologically and economically sound manner.

If you have questions about these courses or suggestions for courses that you think are needed, contact Rhett Johnson, GLTI @ (817) 334-5232, ext. - 3606.

International Exchange



GLTI Goes to Russia

Temperatures heated up as the days of summer moved forward and two members of the Grazing Land Technology Institute traveled to the colder climates of Siberia, Russia. The purpose of the venture was to exchange technology relating to reindeer management, husbandry and developing methods of recording utilization by reindeer in the tundra and forests of Siberia.

Arnold Norman and Pat Shaver were accompanied by GIS specialist Pete Biggam to the Kamchatka Peninsula. They were met by the members of the group headquartered in Elizovo who are in charge of managing the reindeer herds in the districts of Ust-Charusovo, Palana and Bistrinsk. The American team trained the group in the use of the Grazing Lands Applications (GLA) program to record inventoried lands and determine reindeer days for their districts. Most resource information has already been

collected but not automated. GLA will be their future method of automation and the herds' grazing will be recorded in the grazing scheduler of GLA.

The group reviewed reindeer herds consisting of 1000 animals each in the Palana District and met with local herd owners and herders. The herdsmen feel that 1000 head is a manageable herd number for 2 - 3 herders. These herders remain with the herd throughout the year moving to and from summer and winter grazing areas. All travel following the herds is done on foot or horse. District managers travel to the herds via helicopter then remain with the herds for 2 - 3 months gathering information about the herd and utilization of the forage areas. The Siberian herds are excellent in quality, but marketing is almost non-existent.

A team of Russian scientists will also visit Alaska in August to view Alaskan herds and compare management techniques, husbandry and marketing. The group will visit herds near Nome and on Saint Lawrence Island. The exchange of technology will continue between the countries in the future.

Diversification Through Agroforestry

by Jim Robinson

There are many opportunities to incorporate trees into a farm or ranch enterprise. Agroforestry is using trees to achieve an intended purpose in agriculture. Agroforestry systems produce more than one crop off the same acreage to provide an economic benefit; protect livestock from environmental stress such as cold winds or heat; protect the environment, improve biological

diversity in the landscape and provide habitat for wildlife species.

Of course the area of the country, climate, and landscape will dictate what agroforestry system is applicable and what types of problems or objectives an agroforestry system can address.

There are several common agroforestry systems that have potential application in a livestock enterprise. They are:

Livestock windbreaks or living barns. Closely spaced trees and/or shrubs are established perpendicular to the prevailing troublesome winter winds and strategically located adjacent to setting where livestock naturally concentrate or are confined. They significantly reduce wind-chill thus controlling energy loss and feed intake requirements by livestock to maintain body weight and health and improve calf crop survival during inclement weather. They also provide these benefits to wildlife.

Living snowfence is a special purpose windbreak that is designed to trap snow to prevent snowdrifting of travel lanes or other areas. This can be very important in areas subject to severe drifting that may prevent servicing herd needs or other management activities.

Alley cropping is the planting of trees or shrubs in rows or corridors with alleys of agronomic crops or forage between. Plantings are placed at intervals across the field that allow the companion agronomic or forage crop adequate solar energy units required for plant production. These plantings are commonly used to:

- ◆ produce wood or tree products such as pecan, black walnut wood and nut meats species

along with the desired agronomic crop or forage

- ◆ evenly trap snow across the field to harvest moisture in moisture deficit areas
- ◆ improve crop or forage quality and quantity by enhancing microclimatic conditions
- ◆ reduce excess subsurface water or control water table depths
- ◆ provide favorable habitat for species beneficial to crops or forage
- ◆ provide wind or water erosion control
- ◆ improve waste application utilization.

Silvopastoral Systems is the managing of the overstory trees and the understory forage to provide the desired economic and environmental benefits. The tree canopy is managed to allow sufficient solar energy for desired production. The primary purpose of a silvopastoral system is to:

- ◆ produce wood or tree products in addition to forage
- ◆ improve forage quality and quantity by enhancing microclimatic conditions favorable to forage species
- ◆ improve utilization and recycling of soil nutrients for forage use
- ◆ reduce excess subsurface water or control water table depths
- ◆ provide conditions favorable for target wildlife species.

Trees are managed at a sufficiently wide spacing to allow adequate light to the understory forage. Generally, canopy cover ranges from 5 to 50% depending upon the needs of the forage species and the desired production level. An analysis must be made on what system best meets the objectives of the enterprise. For example, it may be that maximizing the tree production while still maintaining 50% of

potential forage provides the greatest economic return or that managing the trees to provide maximum forage potential is the optimum economic return. Once the desired objective is selected, the management of both the trees and grass in concert with one another is essential for the success of the system.

Riparian Forest Buffers or riparian woody buffers are a corridor of trees, shrubs, grasses and forbs that are managed to protect and stabilize the stream system from some of the potential adverse impacts of agriculture, such as, animal concentration areas, animal waste application areas, intensively cropped areas, and potential nutrient and sediment impacts.

The primary purposes for riparian forest buffers are:

- ◆ to protect near-stream soils from over-bank flows,
- ◆ to trap and sequester chemicals or sediment transported by surface and subsurface flows from adjacent land uses
- ◆ to provide shade, detritus and large woody debris for the enhancement of the in-stream habitat
- ◆ and to provide wildlife habitat.

Riparian forest buffers must be sufficiently wide to achieve the primary purpose. This is usually between 15 to 100 feet wide or more.

Trees and agronomic crops or forages can be used in combination to solve specific problems, enhance the economies of the existing operation, or provide opportunities for additional economic, environmental or social benefits. Trees can provide the opportunity to utilize vertical space not typically used in conventional agricultural systems. The systems

described in this article are only examples of some of the more typical systems that may be utilized. As technology or needs develop expanded or new systems can be developed and tested to address unique situations and problems.

Future Editions of the Grazing Lands Roundup

If you prefer to access Grazing Lands Roundup on the Internet, you may do so by accessing the GLTI homepage at: www.ncg.nrcs.usda.gov/gllti/homepage.html

If you choose to receive it via Internet, please send an e-mail message and we will discontinue sending the paper copy. Send your request to: dianne_johnson@ftw.nrcs.usda.gov

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